



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

**Two Essays in Applied Economics:
Pay-As-You-Go Auto Insurance
and Privatized Military Housing**

**By: Keith T. Adkins
June 2004**

**Advisors: David R. Henderson
Raymond E. Franck, Jr.**

Approved for public release; distribution is unlimited.

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE June 2004	3. REPORT TYPE AND DATES COVERED MBA Professional Report	
4. TITLE AND SUBTITLE: Two Essays in Applied Economics: Pay-As-You-Go Auto Insurance and Privatized Military Housing			5. FUNDING NUMBERS	
6. AUTHOR(S) Keith T. Adkins				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this report are those of the author(s) and do not reflect the official policy or position of the Department of Defense or the U.S. Government.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT (maximum 200 words) <p>This MBA Project applies economic principles to assess changes affecting the automobile insurance industry, Pay-as-You-Drive (PAYD) and Pay-at-the-Pump (PATP). These changes could affect DoD in the future. The Project also applies economic principles to Basic Allowance for Housing (BAH) and the Military Housing Privatization Initiative (MHPI) currently affecting DoD. Each program is explained; then selected economic principles are applied that may influence decision-making of major stakeholders. Both PAYD and PATP automobile insurance provide consumers with the option to pay an amount for insurance directly related to actual miles driven. The shift from a fixed to a variable cost for automobile insurance creates an incentive for consumers to drive less, thus saving on the total cost of automobile insurance.</p> <p>BAH and MHPI together represent a shift in how DoD calculates and pays for housing of military service members. Congress and DoD are challenged with rebuilding military housing after decades of neglect.</p>				
14. SUBJECT TERMS Pay-as-you-drive, PAYD, Pay-at-the-pump, PATP, Basic Allowance for Housing, BAH, Military Housing Privatization Initiative, MHPI, Military housing			15. NUMBER OF PAGES 71	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL	

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release; distribution is unlimited.

**TWO ESSAYS IN APPLIED ECONOMICS: PAY-AS-YOU-GO AUTO
INSURANCE AND PRIVATIZED MILITARY HOUSING**

Keith T. Adkins, Lieutenant, United States Navy Reserve

Submitted in partial fulfillment of the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

from the

**NAVAL POSTGRADUATE SCHOOL
June 2004**

Authors:

Keith T. Adkins

Approved by:

David R. Henderson

Raymond E. Franck, Jr.

Douglas A. Brook, Dean
Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

THE APPLICATION OF ECONOMIC PRINCIPLES IN DECISION-MAKING

ABSTRACT

This MBA Project applies economic principles to assess changes affecting the automobile insurance industry, Pay-as-You-Drive (PAYD) and Pay-at-the-Pump (PATP). These changes could affect DoD in the future. The Project also applies economic principles to Basic Allowance for Housing (BAH) and the Military Housing Privatization Initiative (MHPI) currently affecting DoD. Each program is explained; then selected economic principles are applied that may influence decision-making of major stakeholders. Both PAYD and PATP automobile insurance provide consumers with the option to pay an amount for insurance directly related to actual miles driven. The shift from a fixed to a variable cost for automobile insurance creates an incentive for consumers to drive less, thus saving on the total cost of automobile insurance.

BAH and MHPI together represent a shift in how DoD calculates and pays for housing of military service members. Congress and DoD are challenged with rebuilding military housing after decades of neglect.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I.	CONVERTING AUTOMOBILE INSURANCE TO A VARIABLE COST: BACKGROUND, ATTRIBUTES AND ISSUES	1
A.	BACKGROUND	1
B.	TWO FORMS OF PAY-AS-YOU-GO AUTO INSURANCE	2
C.	ATTRIBUTES.....	4
1.	Economic Attributes of PAYD and PATP.....	4
2.	Criticisms of PAYD and PATP.....	5
3.	Challenges to PAYD and PATP.....	6
4.	Travel Impacts of PAYD and PATP	7
5.	Benefits of PAYD and PATP	8
6.	Advocates of PAYD and PATP.....	9
D.	IMPLEMENTATION OF PAYD AND PATP.....	9
E.	SUMMARY	13
II.	APPLICATION OF ECONOMIC PRINCIPLES.....	15
A.	CHAPTER OVERVIEW	15
B.	EXTERNALITY COST	15
C.	INCENTIVES.....	16
D.	ADVERSE SELECTION	17
E.	ECONOMIC EFFICIENCY	17
F.	RISK.....	18
G.	GASOLINE PRICES.....	22
H.	MORAL HAZARD.....	24
I.	STAKEHOLDERS	24
J.	SUMMARY	25
III.	ANALYSIS OF BASIC ALLOWANCE FOR HOUSING AND MILITARY HOUSING PRIVATIZATION INITIATIVE FOR THE MONTEREY BAY AREA USING ECONOMIC PRINCIPLES	27
A.	BASIC ALLOWANCE HOUSING (BAH) BACKGROUND	27
1.	Determining BAH Rates.....	28
a.	<i>Step 1: Determine Local Housing Cost.....</i>	29
b.	<i>Step 2: Compute the Nationwide Average.....</i>	29
c.	<i>Step 3: Choose a Coverage Rate.....</i>	29
d.	<i>Step 4: Set Local Allowances.....</i>	29
B.	MILITARY HOUSING PRIVATIZATION INITIATIVE (MHPI) BACKGROUND	30
1.	MHPI Process.....	32
C.	CONGRESSIONAL SUPPORT FOR BAH AND MHPI	33
D.	MAJOR STAKEHOLDER CONSIDERATIONS.....	35
1.	Federal Government.....	36
2.	Private Sector	36

3.	Service Members	38
E.	ECONOMIC FACTORS.....	39
F.	OPTIONS AVAILABLE FOR MILITARY HOUSING IN MONTEREY, CA	41
G.	RELATIVE ATTRACTIVENESS OF LIVING ON THE ECONOMY..	42
H.	IS MONTEREY A TYPICAL CASE?.....	42
I.	SUMMARY	43
IV.	CONCLUSION	45
A.	THE APPLICATION OF ECONOMIC PRINCIPLES IN DECISION MAKING FOR CONVERTING AUTOMOBILE INSURANCE TO A VARIABLE COST.....	45
B.	THE APPLICATION OF ECONOMIC PRINCIPLES IN THE ANALYSIS OF BAH AND MHPI FOR THE MONTEREY BAY AREA	46
C.	CONCLUSION	46
	APPENDIX – RECOMMEND CONTINUED RESEARCH.....	49
A	OVERCOMING THE TRAGEDY OF THE COMMONS IN PRIVATIZED HOUSING.....	49
B.	NEUTRALIZING THE SERVICE MEMBERS POWER BASE IN PRIVATIZED HOUSING IN THE MONTEREY BAY AREA	49
	LIST OF REFERENCES.....	53
	INITIAL DISTRIBUTION LIST	55

LIST OF FIGURES

Figure 1.	Odometer Audit	11
Figure 2.	Flat and proportional premiums by VMT per year for urban and rural territories.....	20
Figure 3.	Flat and proportional premiums by vehicle miles traveled per year with \$25 assumed odometer fee.....	21
Figure 4.	Impact of PATP's Surcharge on Gasoline Price when Demand is Price Elastic (D^*D^*) and when Demand is Price Inelastic (D_1D_1).....	23
Figure 5.	Example of Median Out-Of-Pocket Cost and BAH.	30
Figure 6.	MHPI Projects as of 2001.	33

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

Table 1.	Travel Reductions Estimates (2001 dollars).....	8
Table 2.	Benefit Summary.	9
Table 3.	PAYD Legal Status in the States	12
Table 4.	Portion of Military Income spent on Housing by pay grade and dependency status, 1996.	28
Table 5.	National Median Out-of-Pocket Costs for Civilian Housing for Married Personnel, for Selected Pay Grades, Per Month.	34

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENTS

I would like to extend special thanks for the support and patience provided by Dr. Franck and Professor Henderson during the research process.

THIS PAGE INTENTIONALLY LEFT BLANK

I. CONVERTING AUTOMOBILE INSURANCE TO A VARIABLE COST: BACKGROUND, ATTRIBUTES AND ISSUES

A. BACKGROUND

Automobile insurance began in Switzerland in 1904, and was adopted in Norway in 1912, followed by Denmark in 1918.¹ The first discussion of automobile insurance in the United States was in New Jersey in 1916, followed by some form of automobile insurance under consideration in most states by the late 1920s. Early discussions in the United States focused on various types of insurance each requiring an annual premium paid to an insurance company or state fund for compensation of victims from automobile accidents.

Automobile insurance is a significant portion of total vehicle costs, averaging about \$750 per vehicle-year in the United States.² Most drivers spend almost as much on insurance as on gasoline. Insurance is considered a fixed cost with respect to vehicle use; a reduction in vehicle miles traveled (VMT) does not usually provide a comparable reduction in insurance premiums. A portion of the speech by Henry Swift Ives, Vice-president of the Casualty Information Clearing House before the Safety committee of the Cincinnati Automobile Club November 10, 1925 highlighted his concerns about the automobile insurance cost structure:

I ask the privilege of making a suggestion in regard to the Marx plan. It seems to me it is too complicated. Why bother the motorist with paying his contribution to the “jack-pot” in a lump sum when he gets his policy? Why bother with insurance policies, certificates and all that sort of thing? I think it would be much better to double the present two-cent gasoline tax. That would raise at least \$14,000,000 additional annually, surely enough to finance the wholesale scheme as a starter. This certainly would be a fair and equitable way in which to get the money. The rate could easily be raised when the philanthropical nature of the fund. Foreign cars would contribute, something impossible under the original plan. If you

¹ Bowers. (1929). Compulsory Automobile Insurance. Vol. 2. p. 14.

² Online TDM Encyclopedia. (2003, November). PAYD Vehicle Insurance; Converting Vehicle Insurance Premiums into Use-Based Charges. p. 1.

are going to have a public pork-barrel in Ohio for the indemnification of all automobile victims regardless of the fault, why not make the collection system as simple, easy, and painless as possible?³

In the following quote, William Vickrey of Columbia Economics Department explains externalities associated with automobile accidents.

The total cost of highway accidents in 1967 is estimated at from \$8 to \$12 billion, depending in part on the extent to which allowance is made for “pain and suffering” as distinct from strictly monetary loss. This is of the same order of magnitude as the entire current outlay out of highway funds for construction and maintenance of highways. Not all of this cost is borne by highway users as such, even in an average sense; for one thing, most of the cost of injuries to pedestrians, damage to wayside property, and the like is borne by the victim, either through lack of legally demonstrable fault on the part of the driver of the vehicle, failure to press a valid claim because of the costs and inconvenience involved and the uncertainty of recovery, inability to identify the guilty party, lack of insurance coverage or financial resources on the part of the driver, or other reasons. In addition, much of the cost is borne by other segments of the community in ways which do not become part of any charge for highway use: payments under various forms of non-automobile insurance, Blue Cross, and so on; employer’s sick-pay provisions; additional losses to employers through interruption of employment; social security and welfare payments, and the like. It seems not unlikely that there is a subsidy to highway users through such channels of around \$1 to \$3 billion per year.⁴

B. TWO FORMS OF PAY-AS-YOU-GO AUTO INSURANCE

The two forms of Pay-As-You-Go auto insurance examined in this research are Pay-As-You-Drive (PAYD) and Pay-At-The-Pump (PATP). PAYD and PATP are forms of automobile insurance attempting to transform automobile insurance premiums from a fixed to a variable cost. Under the third party system of automobile insurance in the United States, consumers pay a fixed monthly payment derived from various risk factors. PAYD retains fixed monthly payments based upon various risk factors while offsetting

³ Ives, H. S. (1929). Compensation By a Tax on Gasoline. Compulsory Automobile Insurance, Vol. 2. pp. 229-230.

⁴ Vickery, W. (1969). Current Issues in Transportation. Contemporary Economic Issues. p. 209.

regional risk differences through a surcharge at the gas pump. PATP eliminates the monthly fixed cost of insurance while basing premiums mainly on regional risk. PAYD and PATP transform the cost of auto insurance premiums based upon regional risk and VMT. According to one advocate,

PAYD reflects the principal that prices should be based on costs. It gives consumers a new way to save money by returning to individual motorists the insurance cost savings that result when they drive less. Motorists who continue their current mileage would be no worse off on average than they are now, while those who reduce the mileage save money.⁵

PAYD helps reduce traffic congestion and environmental impacts. Additionally, PAYD reduces the need for cross-subsidies currently required to provide affordable unlimited-mileage coverage to high-risk drivers. PAYD can particularly benefit lower-income communities that currently pay excessive premiums.⁶

PATP was prompted by rising auto insurance premiums experienced in several parts of the country.⁷ PATP draws uninsured motorists into auto insurance with the purchase of gasoline. Insurance premiums will likely drop due to the reduction of insuring against uninsured motorists.⁸

PAYD allows customers to pay for insurance in proportion to VMT, a main source of risk. Under PAYD, customers pay only for the insurance coverage used. This price structure gives higher-risk motorists a greater incentive to reduce their driving than lower-risk motorists.

⁵ Online TDM Encyclopedia. (2003, November). PAYD Vehicle Insurance; Converting Vehicle Insurance Premiums into Use-Based Charges. p. 2.

⁶ Ibid. p. 2.

⁷ Khazzoom, D. J. Impact of Pay-at-the-Pump on Safety Through Enhanced Vehicle Fuel Efficiency. The Energy Journal, Vol. 18(3). p. 104.

⁸ Ibid. p. 104.

The surcharge added to the cost of gasoline varies according to coverage assumed under each PATP plan-bodily injury (BI) liability only, or BI plus property damage (BI/PD) liability, etc.-the dollar value of the coverage and so on.⁹

With the various proposals for PAYD and PATP, researchers have cited the societal benefits. The insurance industry takes the lead in mounting major campaigns against both forms of insurance in every state where it is proposed. The criticisms are discussed in the next section.

C. ATTRIBUTES

1. Economic Attributes of PAYD and PATP

- a. **Economic Efficiency:** In a market economy, consumers communicate with producers through a price signal. According to Khazzoom, PATP restores the relationship between the main source of risk exposure and payments for auto insurance that is essential for the efficient operation of the market.¹⁰
- b. **Cost Savings:** The cost of insurance will decrease due to a reduction in VMT.
- c. **Safety:** PATP and PAYD will create a demand for more fuel-efficient automobiles as customers desire to reduce insurance cost.
- d. **Environmental Benefits:** Reduced gasoline consumption accompanied with a reduction in VMT and greater fuel efficiency will help improve air quality and combat global warming.¹¹
- e. **Incorporation of Transportation Externalities:** PATP can reduce transportation externalities that occur in the form of accidents, by incorporating those externality cost in the surcharge.¹²
- f. **Reduction or elimination of uninsured motorist problem:** PATP reduces the moral hazard of citizens who drive without the required automobile insurance.

⁹ Khazzoom, D. J. (2000). Pay-at-the-Pump Auto Insurance: Review of criticisms and proposed modification. *Journal of Insurance Regulation*, Vol. 18, 4. p. 449.

¹⁰ Ibid. p. 451.

¹¹ Ibid. p. 452.

¹² Ibid. p. 452.

- g. Equity Impacts: Current vehicle insurance pricing significantly overcharges motorists who drive their vehicles less than average each year, and undercharges those who drive more.

2. Criticisms of PAYD and PATP

The following criticisms of PAYD and PATP are stated here, not because the author necessarily believes them to be true, but because they are background.

- a. Enhanced Fuel Efficiency: PATP is likely to stimulate the demand for fuel-efficient vehicles. This demand places pressure on vehicle manufacturers to reduce vehicle weight, making vehicles less safe. Crash test ratings from National Highway Traffic Safety Administration support the overall claim that drivers of a compact car are twice as likely to die in car crashes as drivers of SUVs or mid-size cars.¹³ Statistics include 162 deaths for every 1 million registered compact cars, 90 deaths for SUVs and 71 for midsize vehicles. Interestingly, the highway fatality rate has declined by more than 70 percent since the mid-1960s, from 5.5 deaths for every 100 million VMT to 1.5 deaths thus vehicles have been made safer since the mid-1960s.¹⁴ This means that in spite of the reductions in vehicle weights, vehicles have become safer. It is still true, nonetheless, that vehicles would be even safer if heavier.
- b. Adverse Effect of the Fuel Efficiency Differential on the Poor: PATP eliminates the cross subsidy from lower income households that drive less to higher income households that drive more on average.

In 1993, average vehicle fuel efficiency for households with income of \$15,000 or less, was 19.8 miles per gallon – virtually the same as the 20.1 miles per gallon for households with family income in excess of \$50,000. Additionally lower-income households drove 49 percent less on the average than their well-to-do counterparts-14,109 miles versus 27,740 miles for households with annual income of \$50,000 or more.¹⁵

¹³ Ulrich, Lawrence. (2004 March). Size Doesn't Always Equal Safety. Retrieved March 12, 2004, from http://money.cnn.com/2004/03/11/pf/autos/small_n_safe_0404/index.htm.

¹⁴ Ibid.

¹⁵ Khazzoom, D. J. (2000). Pay-at-the-Pump Auto Insurance: Review of criticisms and proposed modification. Journal of Insurance Regulation, Vol. 18, 4. p. 483.

- c. Funds for Transportation Projects: Criticism of PATP includes a decrease in money available for transportation projects.¹⁶ Reducing VMT and increased demand for fuel-efficient vehicles will reduce gasoline consumption. The reduction in gasoline consumption also reduces the revenues generated by sales tax. This in turn reduces the funds available for road maintenance and for the design and construction of new and better highways that tend to be safer but more expensive to build than other types of highways.¹⁷
- d. Vehicle Use Pricing: Studies estimate between a 10% to 20% reduction in VMT would result if all fixed automotive insurance cost were converted to PAYD.¹⁸ With a nationwide \$0.10 per mile increase in PAYD costs, there would be an estimated \$44 billion in congestion reduction benefits over twenty years.¹⁹
- e. Technology: The opportunity to offer PAYD insurance is expanding with increased availability of vehicles with global positioning systems (GPS). Already, for example, On-Star's GPS units will be either standard equipment or available as an option on fifty-one 2004-vehicle models. Additionally, GPS availability is expected to increase due to the lowering cost of products.

3. Challenges to PAYD and PATP

- a. Territory: PATP ignores the territory-rating factor, which the insurers take into account to allow for the impact of traffic density and other location differences on insurance cost.²⁰ Although territorial differences exist among urban areas, most of the territory-related challenges centers on the urban/rural contrast.²¹
- b. Driver Characteristics: PATP does not make provisions for the differences in risks between drivers.

¹⁶ Association of California Insurance Companies. (1990). Comments on Pay-as-You-Drive Proposal, letter to Barbara Crowley, Vice Chair, California Energy Commission, Sacramento, CA. June 18. Thomas A. Aceituno.

¹⁷ Khazzoom, D. J. (2000). Pay-at-the-Pump Auto Insurance: Review of criticisms and proposed modification. *Journal of Insurance Regulation*, Vol. 18, 4. pp. 486-487.

¹⁸ Greenberg, A. Vehicle Use Pricing, FHWA Office of Transportation Policy Studies. p. 1.

¹⁹ Ibid. p. 1.

²⁰ Khazzoom, D. J. (2000). Pay-at-the-Pump Auto Insurance: Review of criticisms and proposed modification. *Journal of Insurance Regulation*, Vol. 18, 4. p. 456.

²¹ Ibid. p. 457.

- c. Insurer Income: One source of insurers' income is investment income. Under PATP and PAYD, insurers do not immediately receive the surcharge collected at the pump. This deprives insurers of investment income, and results in an increase in the insurance premium.²² With advances in technology, premiums collected at the pump can be deposited the same day into insurers' bank accounts similar to banking transactions.
- d. VMT and Traffic Density: Critics argue that PATP is based on the false premise that VMT is a determinant of accident cost and insurance premium.²³
- e. Rural Drivers: Rural drivers will bear a disproportionate share of the burden of eliminating the problem of uninsured motorists even though uninsured motorists tend to be concentrated in urban areas.²⁴ Rural drivers would pay disproportionately more than their exposure to uninsured motorists would warrant, because of their higher mileage compared to urban drivers.²⁵
- f. Long Distance Motorists: Long distance drivers will make extra payments at the pump due to the higher VMT resulting from the higher risk of accidents.

4. Travel Impacts of PAYD and PATP

Table 1 shows the vehicle travel reductions predicted from mileage-based fees:

²² Alliance of American Insurers. (1990). letter to Gary Klein, California Energy commission, San Francisco, CA Alliance of American Insurers, Pacific Region, June 15, James S. Stickles. p. 90.

²³ Khazzoom, D. J. (2000). Pay-at-the-Pump Auto Insurance: Review of criticisms and proposed modification. Journal of Insurance Regulation, Vol. 18, 4. p. 470.

²⁴ Ibid. p. 473.

²⁵ Insurance Institute for Highway Safety. (1995). Pay-at-the-Pump: It Isn't Good Insurance; It Isn't Good Policy, Stephen L. Oesch Arlington VA: Insurance Institute for Highway Safety.

Table 1. Travel Reductions Estimates (2001 dollars).
(From Ref. Online TDM Encyclopedia)

Mileage Fee	Travel Reduction
1¢	-1.8%
2¢	-3.5%
3¢	-5.1%
4¢	-6.7%
5¢	-8.2%
6¢	-9.7%
7¢	-11.2%
8¢	-12.5%
9¢	-13.8%
10¢	-15.2%

(Deakin and Harvey, 1997, Table B-21, updated to account for 30% inflation from 1991 to 2001)

Table 1 indicates projected travel reductions based on mileage fees. Higher-risk motorists would pay larger per-mile premiums and would have a higher incentive to reduce mileage.

5. Benefits of PAYD and PATP

- Consumer savings: The average motorist is predicted to save \$50-100 per year from reductions in insurance costs due to a reduction of VMT and no longer having to pay premiums associated with uninsured motorists.²⁶
- Increased fairness: Current insurance pricing overcharges motorists who drive less than average and undercharge those who drive more than average each year in a price category.²⁷
- Increased affordability: Lower insurance premiums and control over VMT allows more lower-income households to insure a vehicle.
- Reduced Uninsured Driving: PAYD and PATP helps to reduce the number of uninsured motorists because of reduced premiums.

²⁶ Online TDM Encyclopedia. (2003, November). PAYD Vehicle Insurance; converting Vehicle Insurance Premiums Into Use-Based Charges. p. 4.

²⁷ Ibid. p. 5.

- e. Increased safety: Under PAYD, vehicle crashes should decline even more than mileage (a 10% mileage reduction is predicted to reduce crashes by 12-15%) because higher-risk motorists (who currently pay high premiums per vehicle-year) would pay higher per-mile fees, and would therefore have the greatest incentive to reduce their driving under PAYD insurance.²⁸
- f. Emission reduction: PAYD and PATP will reduce energy consumption and pollution emissions.

Table 2 is a summary of benefits associated with PAYD and PATP:

Table 2. Benefit Summary.
(From Ref. Online TDM Encyclopedia)

Objective	Rating	Comments
Congestion Reduction	2	Reduces total automobile travel.
Road & Parking Savings	3	Reduces total automobile travel.
Consumer Savings	3	Provides consumer savings.
Transport Choice	3	Improves automobile affordability.
Road Safety	3	Reduces automobile travel.
Environmental Protection	3	Reduces automobile travel.
Efficient Land Use	3	Reduces automobile travel, particularly benefits urban residents.
Community Livability	2	Reduces automobile travel.

Rating from 3 (very beneficial) to -3 (very harmful). A 0 indicates no impact or mixed impacts.

6. Advocates of PAYD and PATP

Advocates for PAYD insurance come from various backgrounds, from citizen groups lobbying for more equitable auto insurance pricing to environmentalists hoping to improve air quality through more efficient transportation pricing. From a resource economics perspective, PAYD insurance has the potential to improve the efficiency of the transportation system by sending the correct price signal to the consumer.²⁹ Customers will likely treat insurance as a variable cost linked to their driving behavior, rather than a fixed cost paid every six months linked only to vehicle purchases.

D. IMPLEMENTATION OF PAYD AND PATP

Barriers to implementation of PAYD and PATP include cost and political barriers. The largest barrier for implementation of PAYD and PATP is the insurance

²⁸ Ibid. p. 4.

²⁹ Guensler, Randall.(2003). Journal of Insurance Regulation, Vol. 23 Is 3. p. 32.

industry. Insurance companies' primary concern is the general public gaining knowledge of current pricing strategies that lack a clear relationship to VMT and potentially discriminate against lower income customers. Additionally, insurance companies face relatively high administration costs to establish an odometer auditing system. With all other things equal, that argument works against the implementation of PAYD and PATP. The insurance industry will capture a smaller portion of the total benefits under PAYD and PATP, since most financial savings will be passed back to customers over the long run. Insurers do not profit from reductions in uncompensated crash costs, congestion, or infrastructure costs, or benefit directly from increased equity. A pricing strategy that reduces total VMT could reduce the insurance industry's profits when competition requires a comparable reduction in premiums.

Various methods can be used to calculate and collect premiums. One method is the prepayment of expected VMT for the coverage period. The total premium is calculated at the end of the coverage period based on actual VMT. Customers are credited for outstanding VMT or pay additional premiums to cover the additional risk exposure.

A different approach is for insurance companies to bill customers based on monthly VMT, similar to utilities. This requires frequent data collection, via odometer audits or GPS systems. Figure 1 describes an odometer audit.³⁰

Odometer Audits

Odometer audits involve the collection of odometer data by a certified business. An odometer audit requires five steps:

1. Check speedometer and instrument cluster for indications of tampering.
2. Record tire size and check that it is within the specified range.
3. Attach a small seal to the ends of mechanical odometer cables to indicate if it has been removed. This is unnecessary on most newer vehicles with electronic speedometers.
4. Check odometer accuracy and calibrate with a dynamometer (this step is optional, or could be performed on a spot-check basis).
5. Record odometer reading and forward results to the vehicle licensing agency.

³⁰ Ibid. pp. 2-3.

Odometer audits would be performed when a vehicle's insurance is renewed, in most cases once a year. Odometer audits typically require 5 to 10 minutes, and less if performed with other vehicle servicing (tune ups, emission inspections, etc.), with an incremental cost of \$5 to \$10 (assuming charge out rates of \$60 per hour). Existing vehicle service businesses and emission inspection stations could be certified as auditors, and some insurance agencies might offer free audits as a marketing strategy. Auditors could be certified by a government agency, as with other types of public services, or by individual insurance companies or insurance professional organizations.

There are concerns that odometer fraud could be a problem, but odometer audits should provide data as accurate as that used in other common commercial transactions and more accurate than self-reported information now used for insurance pricing. Most tampering can be detected during audits and crash investigations, and fraud would void insurance coverage. Vehicle manufactures produce increasingly tamper-resistant odometers since leases, warranties and used-vehicle sales all rely on odometer readings. Audits would provide additional benefits, including accurate mileage information for used-vehicle buyers, and more accurate information for transportation planning.

Other systems could be used to measure vehicle use, including special on-board electronic meters and GPS-Based Pricing, but these add significant costs and raise privacy issues.

Figure 1. Odometer Audit
(From Ref. TDM Encyclopedia)

PAYD pricing requires a method for verifying VMT. The simplest approach is to have customers report odometer readings, with random spot checks. The most sophisticated is Progressive's use of GPS transponders to track a vehicle's driving (an increasing portion of new vehicles have factory-installed transponders).³¹ Another approach is to require odometer audits.

A significant barrier to PAYD and PATP involves insurance companies obtaining accurate VMT data due to associated implementation cost and privacy issues. Three methods discussed throughout the literature include odometer audits, on-going vehicle tracking (GPS), and radio frequency identification systems. Each of the three methods poses unique challenges and implementation issues erecting potential barriers of entry for both PAYD and PATP automobile insurance plans through the extensive investment in capital to implement each system.

³¹ Online TDM Encyclopedia. (2003, November). PAYD Vehicle Insurance; Converting Vehicle Insurance Premiums Into Use-Based Charges. pp. 2-3.

The insurance industry has generally opposed PAYD pricing because it requires changes in their practices and may reduce long-term profits by reducing total premiums.³² PAYD insurance requires a network of VMT audits and changes in the calculation of premiums, so insurance companies will have trouble with implementation.

Individual insurance companies can implement PAYD and PATP pricing once legal and administrative regulatory barriers are relaxed. States may implement legislation to encourage insurance companies to offer PAYD pricing, and public-private projects can help pilot and promote this pricing option.

State governments and existing state laws serve as potential barriers for entry for PAYD insurance. Table 3 indicates which states currently have laws and regulations that would allow the new pricing structure.³³

Table 3. PAYD Legal Status in the States
(From Ref. Journal of Insurance Regulation)

Legal Status	Do Not Prohibit PAYD Insurance	Do Not Allow PAYD Insurance
States	AZ, AL, CO, FL, GA, ID, IL, IA, KS, KY, MD, ME, MI, NV, OH, OK, OR, PA, SC, SD, TN, TX, UT, VA, WA, WV, WI	AR, CA, DE, IN, LA, MA, MN, MS, MO, NC, ND, NE, NH, NM, NY, WY
Number of states	27	16
Percent of states	63%	37%

Table 3 indicates the majority of states would not have to change state laws to permit the insurance industry to offer PAYD insurance. Of all the states allowing PAYD, only two states have implemented PAYD insurance (Texas and Oregon). Texas and Oregon passed legislation supporting the implementation of PAYD. Following Progressive's pilot program in Texas, no insurance company is offering PAYD in Texas. PAYD automobile insurance will not be available in Oregon until 2005. None of the

³² Ibid. p. 6.

³³ Guensler, R. (2003). Journal of Insurance Regulation, Vol.2, Current state regulatory support for Pay-as-You-Drive automobile insurance options. p. 2. According to the research conducted by Guensler, data was only available on 43 states. Two states do not have mandatory automobile insurance.

remaining states currently permits PAYD insurance to be offered in its state until legislation in support of PAYD is proposed and passed.

E. SUMMARY

In summary, the conversion of automobile insurance from a fixed to a variable cost has many positive externalities including insuring the previously uninsured drivers. However, most of society is unfamiliar with the positive aspects of PAYD and PATP since these forms of automobile insurance are offered only in a few locations within the U.S. (Texas, and Oregon). Both forms of insurance face unique challenges during the implementation stages in each new state introduced. Chapter II will analyze the conversion of automobile insurance from a fixed to a variable cost through an assessment of economic factors.

THIS PAGE INTENTIONALLY LEFT BLANK

II. APPLICATION OF ECONOMIC PRINCIPLES

A. CHAPTER OVERVIEW

Chapter II analyzes and applies economic principles concerning PAYD and PATP insurance. Each economic principle will be described and then applied to PAYD and/or PATP automobile insurance.

It is important to note that PAYD and PATP insurance plans are different with regard to implementation and coverage issues. However, both forms of insurance involve the conversion of automobile insurance from a fixed to a variable cost.

Key principles to be defined in the content of PAYD or PATP are externality cost, incentives, adverse selection, economic efficiency, barriers to entry, risk, and stakeholders.

B. EXTERNALITY COST

Externality cost is a cost or benefit arising from any activity, which does not accrue, to the person or organization carrying on the activity.³⁴ An example of an externality is a situation in which A's contract with B imposes cost on C.³⁵

PAYD and PATP can reduce and possibly eliminate transportation externalities occurring in the form of accidents, by incorporating those externalities in the surcharge at the pump. A large portion of accident costs is borne by the victims or by other segments of the community.³⁶ The total cost of highway accidents in 1967 was estimated at \$8 to \$12 billion, depending in part on the allowance made for pain and suffering as distinct from strictly monetary loss.³⁷ Of the total cost of highway accidents in 1967, about \$1 to

³⁴ Black, J. (1997). A Dictionary of Economics. pp. 168-169.

³⁵ Friedman, D. (1983). The Fortune Encyclopedia of Economics, Law and Economics. pp. 694-696.

³⁶ Khazzoom, Daniel. (2000). Pay-at-the-Pump Auto Insurance, Review of Criticisms and Proposed Modifications, Journal of Insurance Regulation. pp.452-453.

³⁷ Vickery, William. (1969). "Current Issues in Transportation," in Neil W. Chamberlain ed., Contemporary Economic Issues, Homewood, IL: Richard D. Irwin, Inc. p.209.

\$3 billion was an externality. According to the National Highway Traffic Safety Administration the total economic cost of motor vehicle crashes in 2000 was \$230.6 billion.³⁸ The exact externality cost is unclear due to missing data concerning identifying accident cost covered by insurance and accident cost borne by society. However, a portion of the cost associated with the loss of productivity and delays in traffic totaled 86.6 billion dollars can be considered an externality.³⁹

C. INCENTIVES

Incentives are rewards or penalties designed to induce one set of people to act in such a way as to produce results that another set of people want.⁴⁰ Alternatively, another way of defining incentive is the motivation that spurs a person or organization into action based on a perceived benefit gained from taking such action.

Under PAYD and PATP, consumers no longer have as much incentive to buy safer cars. Under the third-party system, insurance companies give discounts to customers with safer vehicles. Discounts for air bags, anti-lock brakes, and On-star are examples of discounts insurers offer to customers with safer vehicles. Additionally, under the third party system, insurers have the incentive to give discounts to customers for safety features that reduce the risk of the customer being involved in an accident on which the insurer will pay a claim.

When automobile manufactures decide to make cars more fuel efficient, two options are available. The first option is to make the car lighter and the second option is to reduce the engine performance. Making an automobile lighter, all other things equal, necessarily sacrifices safety. Compact vehicles, because they contain more safety features than their counterparts a generation ago, are safer than the heavier cars of a generation ago. But they would be even safer if they had those new safety features and

³⁸ National Highway Traffic Safety Administration. (2002). The Economic Impact of Motor Vehicle Crashes, 2000. p.1.

³⁹ Ibid. p.1.

⁴⁰ Black, J. (1997). A Dictionary of Economics. p. 222.

were heavier. The second option, reducing an automobile's performance without changing vehicle weight, does reduce gasoline consumption.

D. ADVERSE SELECTION

According to Richard Zeckhauser, adverse selection involves individuals with superior knowledge of their high-risk behavior taking advantage of insurance companies through the purchase of insurance policies with the perception of receiving a good deal.⁴¹ Adverse selection arises when individuals possess information of their risk behavior that the insurance company does not. With appropriate knowledge of the individual's risky behavior, the insurance company most likely would charge the individual a higher insurance premium in line with the perceived level of risk.

Insurance companies fear adverse selection with the implementation of PAYD. Under the third-party insurance system, insurance premiums are based on numerous risk factors. However, insurance companies benefit from customers who purchase insurance policies and have low annual VMT. Insurance companies believe drivers with low annual mileage would switch to PAYD insurance in order to save on the cost of insurance. The lower cost would potentially result in lower revenues for insurance companies.

E. ECONOMIC EFFICIENCY

Economic efficiency involves the use of scarce resources to meet market demands at minimum cost. In a market economy, consumers communicate with producers through the price signals. The present method of paying for automobile insurance is an inefficient way of pricing the insurance services because it freezes the price signal.⁴² Additionally, the present method of paying for automobile insurance is considered a fixed cost consisting of monthly premiums. There is no clear connection between premiums and

⁴¹ Zeckhauser, R. (1983). Insurance. *The Fortune Encyclopedia of Economics*, pp. 22-26.

⁴² Khazzoom, D. J. (2000). Pay-at-the-Pump Auto Insurance, Review of Criticisms and Proposed Modifications. *Journal of Insurance Regulation*. p.451.

VMT. The uncoupling of risk and payments provides an incentive for customers to drive as much as desired with no increase in insurance premiums. PAYD and PATP internalize the risk to others from additional driving through a charge directly associated with the driving. This charge restores the price signal while converting the cost of automobile insurance to a variable cost. According to Khazzoom, distance-based charges more accurately reflect motor vehicle costs than existing pricing, and increase overall economic efficiency and productivity.

F. RISK

Risk arises when the result of any action may take on more than one value. Risk is characterized as the result of a random drawing for a set of possible outcomes whose distribution is known.⁴³

During the course of research, it was discovered that risk factors affecting risk in the third-party insurance systems include personal, vehicle, vehicle usage, and territory. Various insurance firms weight these factors differently.⁴⁴ Personal risk factors include age, sex, marital status, and driving record. Vehicles as a risk factor included depreciation, safety features, and theft. Additionally, vehicle usage varied depending upon mile driven annually and whether the miles driven were for business or recreation. Finally, territory as a risk factor is determined by the driver's residence, as an estimate of where most of the driving will occur. The justification for territorial classes is congestion and other hazards that are unique geographically. Using the analogy of accident involvement to random sampling, there is a higher accident-sampling rate per million VMT for urban cars than rural cars.⁴⁵

⁴³ Black, J. (1997). A Dictionary of Economics. p. 406.

⁴⁴ Phone interviews conducted on 21 May 2004 with United Services Automobile Association, Nationwide, and Allstate insurance representatives requesting anonymity indicated similar risk factors that were weighted differently by each company in the determination of insurance premiums.

⁴⁵ Butler, Patrick. National Organization for Women. Automobile Insurance Pricing: Operating Cost versus Ownership Cost; the implications for Women. p.743.

Conversion of auto insurance prices to VMT requires determining the average mileage of each driver class. Cost per coverage period divided by miles per coverage period equals cost per VMT. Insurance companies routinely determine cost per coverage period for each territory.

Figure 2 displays the difference in premium charges for VMT during a coverage period between urban and rural areas.⁴⁶ Because parking, taxes, and insurance make the unit cost of car ownership higher in cities, individual cars in urban areas tend to be used by more drivers and the average annual miles per insured car should be more than in rural areas.⁴⁷

Stepped horizontal lines represent the premium cost at the current dollars per year prices for two territories (urban and rural).⁴⁸ Steps at 7,500 miles show the effect of the two future mileage classes, as the represented miles subsequently driven during the policy year.⁴⁹ The two proportional lines extending from the origin represent the premium versus VMT at per-mile prices. The slopes are defined by the current premium divided by the average mileages assumed for each class.⁵⁰ These miles are marked by vertical lines, which connect to the equal premium intersections of the flat and proportional lines. Owing to the different average mileages assumed for the classes, the slope of the urban line is only about three times the slope of the rural line, which probably represents a more realistic difference in risk per mile.⁵¹

The third party insurance system provides incentives for increased risk. The only way consumers have to save insurance expenses—other than by selling one car and using another more intensively or by keeping a young household member from getting a license—is to cut back on coverage.⁵² The reduced coverage shifts the risk from the

⁴⁶ Ibid. p. 744.

⁴⁷ Ibid. p. 744.

⁴⁸ Ibid. pp. 744-745.

⁴⁹ Ibid. p. 745.

⁵⁰ Ibid. p. 745.

⁵¹ Ibid. p. 745.

⁵² Ibid. p. 746.

insurance industry to the customers and shifts costs to employer paid health insurance plans and to social insurance programs funded by taxpayers.

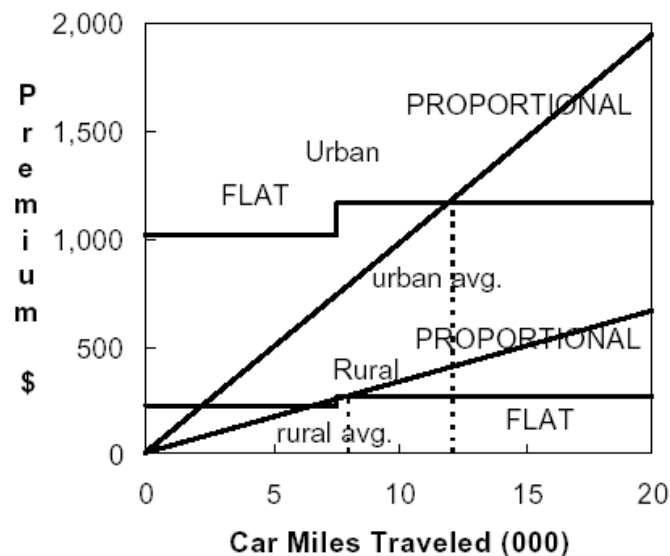


Figure 2. Flat and proportional premiums by VMT per year for urban and rural territories.

(From Ref. Automobile Insurance Pricing)

In contrast to the third party insurance system, PAYD provides an incentive to limit exposure to accident risk with proportional premiums based on VMT. The steepness of proportional premium lines in Figures 2 signals the degree of driving risk with per-mile prices.⁵³ Premiums based on VMT would allow drivers to some control over their insurance cost.

Figure 3 shows premium paid as a function of VMT during the coverage period. The \$500 premium line has no steps for future mileage classes, due to the inability to enforce the step. A class average 10,000 miles per year is assumed, which makes the slope of the proportional premium line 5 cents per mile.⁵⁴ An odometer audit fee--assumed at \$25 --raises the proportional line by that amount and puts the equal premium intersection of the two lines at 9,500 miles.⁵⁵

⁵³ Ibid. p. 746.

⁵⁴ Ibid. p. 746.

⁵⁵ Ibid. p. 746.

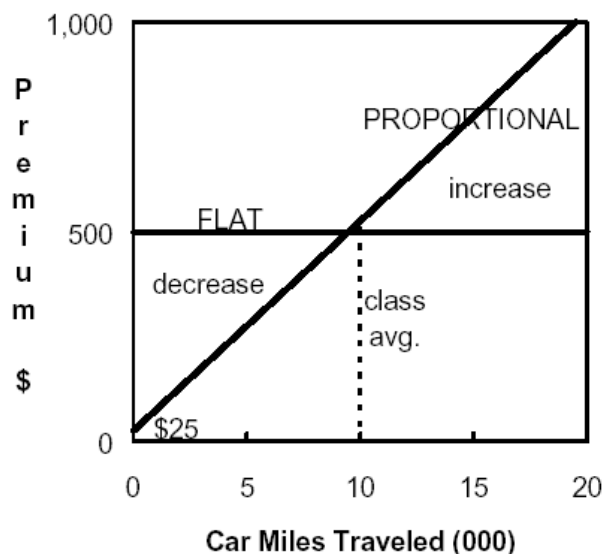


Figure 3. Flat and proportional premiums by vehicle miles traveled per year with \$25 assumed odometer fee
(From Ref. Automobile Insurance Pricing)

The vertical separation between the flat and proportional lines at the number of miles actually driven represents the change in insurance expense with change in exposure unit.⁵⁶ For Figure 2, we assumed a difference in average mileage between rural and urban territories. In estimating the number of future claims, insurers take into consideration expected economic conditions and gasoline prices. When the price of gasoline increases significantly, many drivers reduce the number of trips they take, with the risk of accidents dropping in proportion. At a hearing by the Pennsylvania House insurance committee when the 1990-1991 recession was ending, the President of the Insurance Federation of Pennsylvania testified that auto claims had declined not because of a recent reform law to control medical expense, but because of decreased driving.⁵⁷

When the economy improves or gasoline gets cheaper, auto insurers apply for regulatory approval of higher prices because "people are driving more".⁵⁸ The fact that

⁵⁶ Ibid. p. 746.

⁵⁷ Butler, P. Driver Record: A Political Red Herring That Reveals the Basic Flaw in Automobile Insurance Pricing. *Journal of Insurance Regulation*, Vol. 8. pp. 200-234.

⁵⁸ Ibid.

the insurance industry raises prices when driving increases is evidence that automobile premiums respond to general economic changes and not individual driving changes.

G. GASOLINE PRICES

PATP is criticized by the insurance industry because PATP ignores territory, which insurers include in premiums to allow for impact of traffic density and other differences.⁵⁹ Most of the insurance industry's criticisms center on the urban/rural contrast.⁶⁰ The Union of Concerned Scientists (UCS) discussed the possibility that the PATP surcharge vary in different regions of the state, based on the region's risk characteristics. The concept of a tax varying from county to county is not new. Sales and gasoline taxes vary state-to-state and county-to-county. Gas prices vary from service station to station on the same streets up to ten cents a gallon. Building on the differences of gas prices on the same street, it is plausible to modify PATP by adding a gas surcharge and allowing the surcharge to vary based upon regional risk.

An additional economic consideration is the price of gasoline at territory borders. The price of gasoline will not go up by the full amount of the surcharge, precisely because gasoline demand at the region's border is likely to be elastic.

According to Daniel Khazzoom's research on regional border prices, Figure 4 explains the surcharge on gasoline when the price is elastic and inelastic.

⁵⁹ Khazzoom, D. J. (2000). Pay-at-the-Pump Auto Insurance: Review of criticisms and proposed modification. *Journal of Insurance Regulation* Summer, Vol. 18, 4. p. 456.

⁶⁰ Ibid. p. 457.

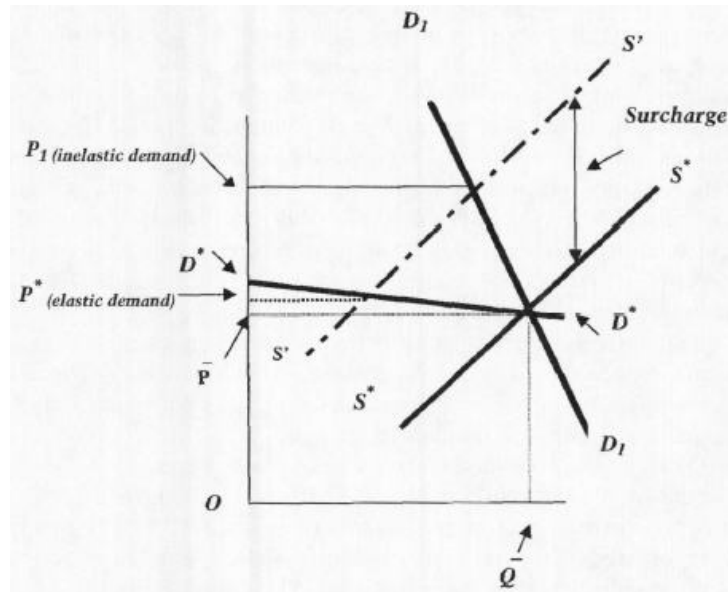


Figure 4. Impact of PATP's Surcharge on Gasoline Price when Demand is Price Elastic (D^*D^*) and when Demand is Price Inelastic (D_1D_1)
(From Ref. Journal of Insurance Regulation)

ELASTIC

$D^* D^*$ represents the demand for gasoline.

$S^* S^*$ represents the supply of gasoline.

\bar{P} and \bar{Q} are the equilibrium price and quantity pair.

$S' S'$ represents PATP's surcharge by a parallel upward shift equal the supply curve to equal to the surcharge.

P^* represents the new equilibrium price with elastic demand.

Increase from \bar{P} to P^* is the net price increase the consumer faces which is less than the amount of the surcharge.

INELASTIC

$D_1 D_1$ represents the demand for gasoline.

$S^* S^*$ represents the supply of gasoline.

\bar{P} and \bar{Q} are the equilibrium price and quantity pair.

$S' S'$ represents PATP's surcharge by a parallel upward shift equal the supply curve to equal to the surcharge.

P_1 represents the new equilibrium price with inelastic demand and is equal to the price increase of \bar{P} to P^* .

The main message of the diagram is that a factor that mitigates the impact of PATP's surcharge differential across adjacent regions is the elasticity of demand near the border between regions.⁶¹

H. MORAL HAZARD

According to John Black's Dictionary of Economic Terms, a moral hazard is the danger that if a contract promises people payments on certain conditions, they will change their conduct in order to make these conditions more likely to occur.⁶² Moral hazard arises when an item is insured, and the owner takes less care of them than if they were uninsured. Simply stated, people with insurance are more likely to engage in risk taking behavior.

PATP introduces a significant moral hazard through its design. Since PATP does not incorporate risk factors associated with individual drivers, a moral hazard is introduced to all drivers.

I. STAKEHOLDERS

PAYD involves insurance companies, insurance regulators, state legislators, and transportation agencies. Motorists, transportation professionals, public safety officials, environmentalists, consumer groups, and organizations concerned all have reasons to support PAYD pricing. The National Motorist Association and the American Automobile Association support PAYD pricing as a way to make insurance more affordable.

⁶¹ Khazzoom, D. J. (2000). Pay-at-the-Pump Auto Insurance, Review of Criticisms and Proposed Modifications. *Journal of Insurance Regulation*. pp. 459-461.

⁶² Black, J. (1997). *A Dictionary of Economics*. p. 309.

J. SUMMARY

The application of economic principles in decision-making is useful when analyzing programs involving significant changes. Economic principles and research analysis reveal relationships of information useful in decision-making. PAYD and PATP insurance programs when reviewed under economic principles reveal potential barriers to entry from both the insurance industry and state legislative bodies. A risk analysis reveals the details of adverse selection, externality cost, and incentives for consumers.

THIS PAGE INTENTIONALLY LEFT BLANK

III. ANALYSIS OF BASIC ALLOWANCE FOR HOUSING AND MILITARY HOUSING PRIVATIZATION INITIATIVE FOR THE MONTEREY BAY AREA USING ECONOMIC PRINCIPLES

A. BASIC ALLOWANCE HOUSING (BAH) BACKGROUND

The National Defense Authorization Act for fiscal year 98 enacted a significant change in the housing allowance for eligible service members in the armed forces. The new form of housing allowance replaced the basic allowance for quarters (BAQ) and variable housing allowance (VHA) with BAH. The purpose of BAH is to protect service members against price variations in housing expenses based on different geographic locations.

The frequency of military moves requires a form of variable housing allowance to avoid substantial changes in the service members' standard of living. Based on a CBO study published in 1998, junior enlisted service members pay approximately thirty percent or more of their military income for housing.⁶³ As a result, the variation in housing prices around the country would translate into large variations in the disposable income of service members and their family if the housing allowance did not also vary.⁶⁴ Table 4 displays the portion of military income spent on housing by pay grade and dependency status in 1996.

BAH is defined according to the service member's geographic location, rank, and marital status. BAH is designed to cover a percentage of the average cost of housing with the remaining portion of housing cost to be paid by the service member. The original percentage of housing cost to be covered by BAH was 85 percent. However, after BAH was introduced, BAH covered approximately 80 percent of the cost of housing shortly after its introduction in 1998.⁶⁵

⁶³ Congressional Budget Office. (1998). Housing Choices, and Military Allowances. p. x.

⁶⁴ Ibid. p. x.

⁶⁵ Ibid. p. x.

Table 4. Portion of Military Income spent on Housing
by pay grade and dependency status, 1996.
(From Ref. CBO Paper October 1998)

Pay Grade	With Dependents	Without Dependents
E-1	33.6	21.4
E-2	31.1	21.9
E-3	31.7	25.3
E-4	31.3	24.0
E-5	30.7	23.5
E-6	28.9	21.4
E-7	27.2	19.9
E-8	26.1	20.1
E-9	23.8	18.3
O-1	29.6	23.5
O-2	27.0	21.5
O-3	23.5	19.7
O-4	23.5	20.5
O-5	21.1	18.0
O-6	19.8	16.9

BAH is a price-based housing allowance based on the average rental rates in each area for a standard unit of housing. For each group of service members, DoD examines the spending patterns of civilian households with similar income to select a standard unit that DoD determines to provide “adequate housing” for the group.⁶⁶

When services members transfer from one geographical area to another, BAH is designed to allow service members to consume similar types of housing without having to sacrifice spending for other purposes.⁶⁷ BAH will increase in areas where housing is expensive and decrease in areas where housing is inexpensive.

1. Determining BAH Rates

In determining BAH rates, understanding DoD’s perception of cost in relation to an allowance is essential. “Cost” approximates the prevailing market price, not what service members actually spend but what they would have to spend in each area to obtain

⁶⁶ Ibid. p. x.

⁶⁷ Ibid. p. 7.

a certain standard of housing.⁶⁸ BAH rates are based on 350 military housing areas (MHAs) that divide the country. A four-step process is used to determine BAH rates.

a. Step 1: Determine Local Housing Cost

Local housing cost refers to the local price of a particular unit of housing. DoD has established a housing standard for each pay grade and dependency-status group. The law requires the standard based on the cost of adequate housing for civilians with comparable income levels. Once the unit is determined, DoD then determines what the standard unit would rent for in each of the MHAs.

b. Step 2: Compute the Nationwide Average

The second step is to compute a reference housing cost, similar to a national average price for housing. DoD computes a weighted average of the local prices for each group's standard housing unit.⁶⁹

c. Step 3: Choose a Coverage Rate

The third step is to decide what portion of the reference housing cost will be covered by the housing allowance. The original intent of BAH was to cover 85 percent of the reference cost.

d. Step 4: Set Local Allowances

The final step is establishing the allowances. The reference housing cost and the coverage rate determine the amount of the allowance for the reference area. The allowance rate in any particular MHA is equal to the allowance for the reference area plus the difference between the local housing cost and the reference cost.⁷⁰ BAH is a

⁶⁸ Ibid. p. 9.

⁶⁹ Ibid. p. 10.

⁷⁰ Ibid. p. 11.

variable allowance that is designed to compensate for the differences between two geographical areas as displayed in Figure 5.⁷¹

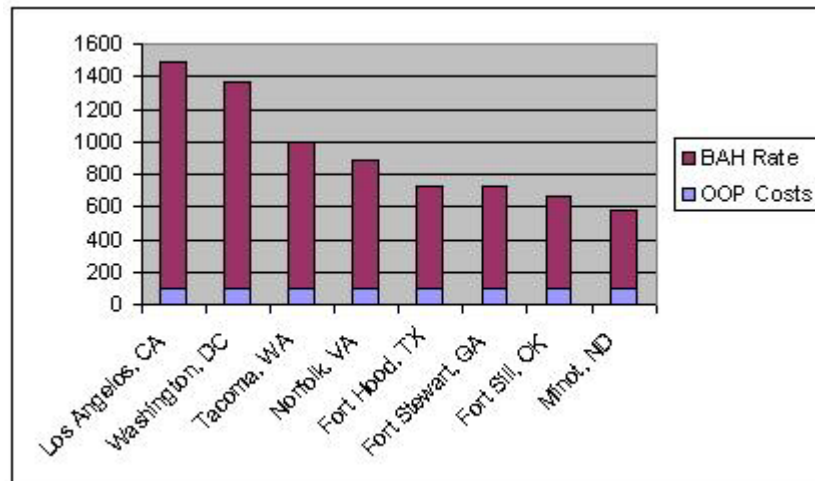


Figure 5. Example of Median Out-Of-Pocket Cost and BAH.
(From Ref. DITC Website)

B. MILITARY HOUSING PRIVATIZATION INITIATIVE (MHPI) BACKGROUND

MHPI was authorized by Congress in the National Defense Authorization Act in 1996 to encourage privately funded development of housing for use by service members.⁷² The quality of housing available to service members is considered one of the most important components in defining the military's quality of life for service members.

During the past four decades, housing for military personnel and their families has been a low priority for military construction. After a rapid expansion throughout the 1950s and early 1960s, the effort devoted to the construction and maintenance of military housing did not keep pace with natural deterioration and changing societal definitions of adequate housing. DoD estimates 180,000 of the 300,000 military family units no longer

⁷¹ DoD Per Diem, Travel and Transportation Allowance Committee. Retrieved April 12, 2003, from <http://www.dtic.mil/perdiem/bahfaq.html>.

⁷² Else, D. H. (2001, July). CRS Report for Congress, Military Housing Privatization Initiative: Background and Issues. p. CRS-1.

meet its standard for adequate housing as of 1996.⁷³ Of these, DoD has determined that more than half do not meet its current housing standards with regard to living space amenities, etc. DoD estimates that the use of traditional methods of contracting and construction would take 30 years and 16 billion dollars to resolve the military housing problem.⁷⁴

DoD believes a significant increase in the military housing allowance, a continuation of traditional construction, and MHPI will eliminate housing inadequacies by 2010.⁷⁵ DoD has a self-imposed deadline for 2010 to either refurbish or replace substandard housing units.

MHPI results in the construction of more housing built to market standards, for less money than through the military construction process. Not only is commercial construction faster and less costly than military construction, but commercial sector funds significantly stretch and leverage DoD's limited housing funds.⁷⁶

According to DoD sources, the military's cost for building a house in 1998 was \$135,000 (excluding land), substantially higher than private industry averages for comparable homes in many areas.⁷⁷

Priority to occupy the housing units is given to service members. However, if there is not enough demand for housing by service members, and as a result, occupancy rates drop below a certain level, the developer can rent to other personnel, but must follow a priority list of other tenants.⁷⁸ The following priority list is typically used:⁷⁹

⁷³ Ibid. p. CRS-1.

⁷⁴ Ibid. p. CRS-2.

⁷⁵ Ibid. p. CRS-2.

⁷⁶ Ibid.

⁷⁷ Gutierrez, R. (2001 July). Military Housing

⁷⁸ Else, D. H. (2001, July). CRS Report for Congress, Military Housing Privatization Initiative: Background and Issues. p. CRS-2.

⁷⁹ Ibid.

Unaccompanied service members
Federal civil service employees
Retired military
Guard and reserve military
Retired federal civil service employees
DoD contractors/permanent employees
General public

1. MHPI Process

MHPI has two central features of flexibility and decentralized execution that enables DoD to negotiate quickly with the private sector. Before DoD requests bids, each service must first conduct site reviews and a feasibility study for each installation to identify housing needs. The results of the studies are briefed to the Office of Competitive Sourcing and Privatization for approval. Once approved by the Office of Competitive Sourcing and Privatization, the service is allowed to develop an appropriate solicitation proposal. Congress is notified when the successful solicitation response is selected and prior to the awarding of a contract. Figure 6 indicates MHPI projects as of 2001.⁸⁰

In the event of a base realignment and closure (BRAC), developers will still own and manage the leased property and housing and therefore can rent to the private market.⁸¹ In cases where there is a limited or non-existent secondary market, the project may use the authorities provided under Section 2873, direct loans and loan guarantees, which allows DoD to provide a limited guarantee against BRAC.⁸²

⁸⁰ An updated listing was not available during the research of this paper.

⁸¹ DoD Housing and Competitive Sourcing MHPI. Retrieved April 12, 2003, from <http://www.acq.osd.mil/ie/index.htm>.

⁸² Ibid.

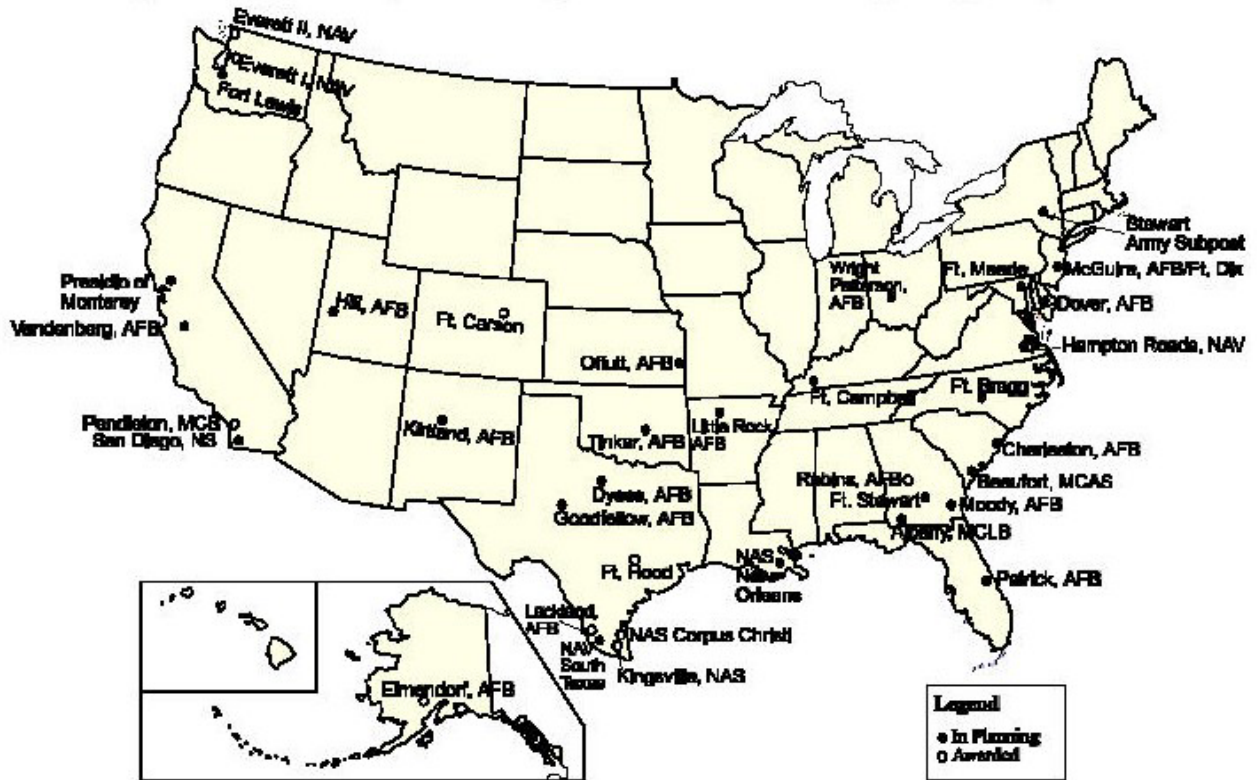


Figure 6. MHPI Projects as of 2001.

(From Ref. CRS Report RL31039)

C. CONGRESSIONAL SUPPORT FOR BAH AND MHPI

Due to the rising cost of out-of-pocket expenses for service members to live in the communities surrounding military installations, DoD recommended and Congress passed legislation in 2000 to reduce out of pocket cost for service members to zero by 2005. Out of pocket cost includes rent and utilities necessary for a household that exceeds the amount of housing allowance provided to the service member. In 2002, Congress approved appropriations increasing the military housing allowance in fiscal year 2003 to reduce service members' out of pocket cost to 7.5 percent of base pay. The reduction continued in 2003 with Congress approving appropriations increasing housing allowance thus reducing service members' out of pocket cost to 3.5 percent of base pay for fiscal year 2004. The President's budget for fiscal year 2005 submitted in February 2004 supports an increase of BAH to reduce out of pocket cost to zero. Table 5 is from GAO

report 01-684 and provides the national median out-of-pocket cost for civilian housing for military personnel.⁸³

Table 5. National Median Out-of-Pocket Costs for Civilian Housing for Married Personnel, for Selected Pay Grades, Per Month.

(From Ref. GAO Report GAO 01-684)

Enlisted		Officers	
E1-E3	\$116	O-1	\$137
E-4	123	O-2	153
E-5	135	O-3	179
E-6	153	O-4	201
E-7	163	O-5	216
E-8	173	O-6	218
E-9	185		

Note: These costs reflect the 15 percent out-of-pocket expense for civilian housing applicable in 2001.

Congressional support of MHPI has remained constant since 1995. Congress has supported DoD's budget to rebuild and or refurbish approximately 168,000 military housing units by 2010.⁸⁴ Additionally, Congress has provided the following twelve incentives to attract the private sector into MHPI:⁸⁵

1. Conveyance of rental property: The government may transfer title of federal property to private ownership.
2. Relaxation of federal specifications for housing construction: Builders are allowed to construct housing in accordance with local building codes.
3. Inclusion of ancillary support facilities: Bids for contracts may incorporate additional amenities, such as childcare centers and dining facilities, to enhance the attractiveness of the basic housing.
4. Payment of rent by allowance: Landlords may receive payment of rent through automatic electronic funds transfer from the appropriate federal disbursing facility, guaranteeing cash flow.
5. Loan guarantee: The government may guarantee up to 80% of the private sector loans arranged by the property developer.

⁸³ GAO Report GAO-01-684, (2001). Military Personnel: Higher allowance Should Increase Use of Civilian Housing, but Not Retention. p. 4.

⁸⁴ Ibid. p. 5.

⁸⁵ Else, D. H. (2001, July). CRS Report for Congress, Military Housing Privatization Initiative: Background and Issues. p. CRS4-5.

6. Direct loan: The government may make a loan directly to a contractor.
7. Differential lease payment (DLP): The government may agree to pay a differential between the BAH paid to service members and local market rents.
8. Investment (Joint Venture): The government may take an equity stake in a housing construction enterprise.
9. Interim leases: The government may lease private housing units while awaiting the completion of a project.
10. Assignment of service members: Service personnel may be assigned to housing to a particular project that they may otherwise not choose to occupy (tenant guarantee).
11. Build to lease: The government may contract for the private construction of a housing project and lease its units.
12. Rental guarantee: The government may guarantee a minimal occupancy rate or rental income for a housing project.

Overall, Congress has supported DoD's desires to decrease the service members' out of pocket cost for housing through an increase of BAH since 2000. Additionally, Congress has shown its support of the refurbishment and rebuilding of military housing units through the twelve tools provided to DoD to attract the private sector in participating in MHPI. Current legislative support expires in 2012. The expiration of the legal authorities will not affect completed deals. As for future projects, the DoD is currently working to obtain permanent authority from Congress.⁸⁶

D. MAJOR STAKEHOLDER CONSIDERATIONS

In order to understand the relationship between BAH and MHPI, the major stakeholders must be identified and their associated interest understood. The three major stakeholders concerning BAH and MHPI are the federal government, private sector, and active-duty service members. Many additional stakeholders exist but for simplicity, this paper will focus on the major three stakeholders located in the Monterey Bay area.

⁸⁶ DoD Housing and Competitive Sourcing MHPI. Retrieved 12 April, 2003 from <http://www.acq.osd.mil/ie/index.htm>.

1. Federal Government

The federal government has passed legislation to entice the private sector to enter the military housing market in the Monterey Bay area. Specifically, the federal government has authorized the following MHPI program authorities in the Monterey Bay area:

1. Conveyance of real property
2. Relaxation of federal specifications for housing construction
3. Inclusion of ancillary support facilities
4. Payment of rent by allotment

The federal government's main interest is improving the military housing located in the Monterey Bay area through refurbishing and rebuilding existing military housing by 2010. The improvement of military housing located in Monterey Bay area is likely to have an impact on the quality of life of service members within the Monterey Bay area.

In financial terms, the cost to the federal government by avoiding the long-term management, operation, and construction costs for the Monterey Bay housing area is offset by paying service members their BAH. The projected federal government savings over the long-term is estimated to be 10% of total costs.⁸⁷ The most significant advantage of MHPI is the speed at which Clark Pinnacle can refurbish and rebuild housing when compared to the traditional military construction methods.

2. Private Sector

Clark Pinnacle is a limited liability corporation formed from Clark Realty Builders, Pinnacle Realty Management Company, Department of the Army, and Department of the Navy out of the state of Delaware.⁸⁸ Since Clark Pinnacle is a limited liability corporation, corporate creditors have claims only against Clark Pinnacle assets. This means the founding companies are not vulnerable to corporate creditor's claims. Furthermore, bankruptcy is an available option for Clark Pinnacle in the event of sustained substantial financial losses.

⁸⁷ Ibid.

⁸⁸ Collier, B. Residential Communities Initiative Deputy Director. Interview. (2004 April 16).

The federal government, with its membership in Clark Pinnacle, is a stakeholder in the private sector. The Department of the Army has established an office at Fort Ord called Residential Communities Initiative (RCI) for monitoring the daily operations of the 50-year ground lease between the federal government and Clark Pinnacle. Clark Pinnacle's major members of the board of directors are the Superintendent Representative from the Naval Postgraduate School (NPS), Senior Army Garrison from the Defense Language Institute (DLI) and Managing members of Clark Pinnacle.⁸⁹

On 9 July 2002, Congress awarded the Monterey family housing privatization initiative to Clark Pinnacle Family LLC and approved the Community Development and Management Plan on 30 June 2003, worth \$709.8 million during the initial development period (ten years) and up to \$3.5 billion over the next 50 years.⁹⁰

Operating income for Clark Pinnacle is derived from rental payments from occupants within military housing.⁹¹ Clark Pinnacle has a current occupancy rate of 89 percent.⁹² Clark Pinnacle is currently experiencing larger than expected losses from the operation of privatized housing primarily due to lower than expected occupancy rates.⁹³ An occupancy rate of 95 percent is required for the financial success of privatized housing in the Monterey Bay area. The larger than expected losses have lead to programs including "refer a friend" and offers to make two months of rental payments for service members to break leases in the surrounding communities and move into privatized housing.⁹⁴ Because of the lower occupancy rate, Clark Pinnacle has allowed 60 DoD civilians and four Pinnacle employees to occupy privatized housing.⁹⁵ Rental payments from all occupants including military, DoD civilians, and Pinnacle employees are based

⁸⁹ Ibid.

⁹⁰ Elbert, J. (2003 September). Thesis NPS. Military Housing Privatization Initiative Lessons Learned Program: An Analysis. p. 51.

⁹¹ Military housing is now referred to as privatized housing as of 2004 October 01 with Clark Pinnacle assuming control of military housing in the Monterey Bay area.

⁹² Barrett, J. Community Director. Clark Pinnacle. Interview. (2004 Apr 16).

⁹³ Collier, B. Residential Communities Initiative Deputy Director. Interview. (2004 April 16).

⁹⁴ Barrett, J. Community Director. Clark Pinnacle. Interview. (2004 Apr 16).

⁹⁵ Ibid.

on a rank structure. The military rank structure and associated BAH payments from service members are easily obtained from Per Diem, Travel, and Transportation Allowance Committee website. DoD civilians and Pinnacle employee rental information may be obtained by contacting the Residential Communities Initiative at Fort Ord for research purposes.

Clark Pinnacle assumed control of 2,268 housing units and plans to construct 2,209 units by 2013. Break-even and profitability is projected based on two primary factors. The first is improving the occupancy rate, since Clark Pinnacle's main source of income is rental payments. The second factor is attracting service members back to privatized housing once new housing units are constructed and offered to service members.

3. Service Members

Although DoD's policy is to rely on the private market for the majority of military housing needs, in many instances, the junior enlisted personnel cannot afford quality private housing within a reasonable commuting distance.⁹⁶

A goal of MHPI is to bring about a dramatic improvement of the military housing conditions for service members families, and, consequently, an increase in their quality of life, readiness, and morale.⁹⁷

Service members are likely to make decisions whether to live on or off military installations according to their perceived economic benefits. The consumption of housing by service members will depend on their perception and trade offs associated with BAH (commercial housing) and privatized housing. The bottom line is that service members are the customers of privatized housing and BAH.

During the course of research, a new power base for service members was discovered that did not previously exist when the Navy administered military housing in the Monterey Bay area. The new power possessed by service members is the power to

⁹⁶ Congressional Budget Office. (1998 October). Housing Prices, Housing Choices, and Military Allowances. p. 29.

⁹⁷ Else, D. H. (2001, July). CRS Report for Congress, Military Housing Privatization Initiative: Background and Issues. p. CRS-2.

recommend and influence inbound service members in regards to occupying privatized housing. A favorable recommendation means Clark Pinnacle will most likely receive a steady flow of rental payments from sponsored service members. On the other hand, an unfavorable recommendation means Clark Pinnacle will most likely go without the rental payments (revenue) and possibly a decrease in overall occupancy rate. For example, in the Monterey Bay privatized housing, a distinction is made between junior and senior officers at the O3 and O4 pay grades. Clarke Pinnacle has agreed to requests of junior officers to occupy senior officer housing. Attempting to satisfy the customer, Clark Pinnacle has obliged the junior service members' requests in hopes of obtaining a positive endorsement to inbound service members to occupy privatized housing and boost occupancy ratings. The junior service members have clearly undercut the military structure by occupying housing that they are not entitled to occupy based upon the rank structure. Clark Pinnacle currently has an 85 percent occupancy rate and requires a 95 percent occupancy rate for financial success. An unintended consequence of the lower occupancy rate is that Clark Pinnacle is subject to the demands of service members for fear of losing current and future tenants.

E. ECONOMIC FACTORS

When Clark Pinnacle assumed control of privatized housing, a couple of different forms of externalities occurred to the service members. Service members began experiencing temporary inconveniences associated with the daily construction activity within the La Mesa and Fort Ord housing communities. Additionally, some military families have experienced and will experience difficulties associated with moves required to support the various phases of construction. However, most service members have experienced a positive benefit with the improvement in the quality of maintenance and repairs conducted on housing units since Clark Pinnacle assumed control of housing on 1 October 2003. Additionally, an assumed benefit is the improvement in the quality of housing and services received by service members once new homes are constructed.

An immediate improvement experienced by service members and families included over 3,600 calls for maintenance completed during the first quarter of Clark

Pinnacle operations. During the second quarter, there were over 3,300 calls for maintenance. Ms. Barrett, Community Director for Pinnacle views the drop in maintenance calls as a step in the right direction since most the calls include additional repairs not originally included in the maintenance call. The large number of repairs in a six-month period implies the service provided by Clark Pinnacle has improved quality of life for service members that occupy privatized housing.

Military housing can be viewed from the standpoint of the tragedy of the commons. Service members do not have the incentive to conserve the use of utilities because they do not pay for them.⁹⁸ Some of the service members are less likely to care for military housing with the same level of care that would be afforded to a house if they were the owner. Since occupying privatized housing at my third duty station, I have noticed the following differences in the behavior of my family and neighbors when compared to living in the civilian community.

1. Over use of electricity:

- Outside lights stay on longer into the day light hours.
- Lights and televisions are left on when no one is in the room or in the house.
- Washer and dryer loads are smaller.

2. Over use of water:

- Washer loads are smaller.
- Over watering of the yard.
- Longer showers.

3. Over use of gas:

- Dryer loads are smaller.
- Windows are open and the heat is on.

4. Lower level of care for the housing unit:

- Filters are not cleaned and changed as often.
- Lower concern when damage occurs.

⁹⁸ This statement does not accurately reflect the behavior of all service members.

- Maintenance calls are placed even when a quick-fix situation exists.

An interesting challenge for Clark Pinnacle will be for it to address the tragedy of the commons in order to maintain the quality of housing and make a profit while maintaining good relations with tenants.

The federal government, Clark Pinnacle, and service members are all affected by incentives associated with MHPI and BAH. DoD and Congress, recognizing the poor condition of military housing and associated affects on service members, have the incentive to partner with the private sector to remedy military housing shortfalls. The private sector can achieve a higher level of economic efficiency than the federal government in the construction of housing. Congress has provided twelve tools to help entice the private sector into military housing of which four are being used in the Monterey Bay area. Additionally, the federal government has provisions in MHPI contracts to minimize risk against BRAC. Service members will make decisions regarding the decision to occupy military housing or live in community based on perceived incentives.

F. OPTIONS AVAILABLE FOR MILITARY HOUSING IN MONTEREY, CA

Two basic options are available for housing the military in Monterey, CA. The first option is for service members to receive BAH according to pay grade, and martial status based upon Monterey established rates. Under this option, service members receive BAH and must cover the remaining portion of housing cost from their remaining pay. The second option as of 1 October 2003 is to live in privatized housing. The service members receive their BAH and make monthly rental payments to Clark Pinnacle in the exact amount of their BAH. Pinnacle in return provides housing to the service member, covers the cost of utilities, and performs the required maintenance to housing as required by the rental agreement signed at the time the service member accepts privatized housing.

G. RELATIVE ATTRACTIVENESS OF LIVING ON THE ECONOMY

Some service members are living completely on Monterey Bay economy. This has some advantages. A significant non-monetary advantage is being separated from the military environment. Many service members living in housing have made comments relating to the fact they feel like they never leave work.

Monetarily, service members have the opportunity to find cheaper housing and potentially benefit financially when their cost of housing is lower when compared to BAH. As previously mentioned, service members are likely to make decision based on their perceived economic benefits.

An unintended consequence has occurred over the last few years in the Monterey Bay area due to the steady increases of BAH. Current levels of BAH have now provided the opportunity of ownership of property for senior military officers and therefore, fewer senior officers occupy privatized housing. The increase of purchasing power for senior officers has lead to a decrease in the occupancy rates of privatized housing and a decrease in revenue for Clark Pinnacle.⁹⁹

H. IS MONTEREY A TYPICAL CASE?

Monterey is a typical case for the privatization of military housing. An argument can be made that the surrounding communities of NPS and DLI could not support the military demand for housing if privatized housing were not available to the service members. With construction of military bases, military housing is included in the planning phase if the community is unable to support the housing demands associated with the opening a new base or the cost of living for the base location is extraordinary high that living on the economy would place an undue hardship on junior personnel. Both factors are relevant for the Monterey Bay area.

⁹⁹ Collier, B. Residential Communities Initiative Deputy Director. Interview. (2004 April 16).

I. SUMMARY

The application of economic principles is useful when analyzing DoD programs involving significant changes. BAH and MHPI are two DoD programs that have played a major role in how Congress appropriates dollars for military housing construction and military housing allowance. Economic principles and research analysis reveal relationships that are strategic in decision-making. BAH and MHPI when reviewed under economic principles reveal stakeholder incentives, unintended consequences, externality cost and risk for three major stakeholders. A stakeholder analysis was used to identify key role players and associated interest. Views concerning BAH and MHPI depend on individual preferences, incentives, and stakeholder roles.

THIS PAGE INTENTIONALLY LEFT BLANK

IV. CONCLUSION

A. THE APPLICATION OF ECONOMIC PRINCIPLES IN DECISION MAKING FOR CONVERTING AUTOMOBILE INSURANCE TO A VARIABLE COST

The proposed conversion of the third-party automobile insurance from a fixed cost to PAYD or PATP a variable cost was analyzed using select economic principles. The analysis uncovered multiple incentives, externalities, and potential barriers to entry. The significant incentives involved the potential demand for lighter more fuel efficient vehicles, adverse selection by those consumers who could save money with the conversion of automobile insurance to a variable cost, and the insurance industry as a potential barrier to entry due to the potential loss of revenue. The externalities included the incorporating accidents' cost borne by society into a surcharge at the pump and the potential elimination of having to insure against uninsured motorists. Barriers to entry include insurance industry opposition and significant investments in capital required to monitor VMT through various forms of odometer audits or electronic monitoring. The most significant barrier to entry is the state governments that do not have legislation that allow PAYD or PATP.

A risk analysis reveals VMT and territory as significant measurements of risk exposure. The cost associated with a unit of risk was compared between urban and rural locations. Further, an important connection between the VMT and the third-party system revealed a decoupling of fixed insurance payments from a significant measurement of risk exposure (VMT).

Finally, an analysis of gasoline pricing revealed that a high price elasticity of demand would occur at territory boundaries. Gasoline prices would increase and decrease at territorial borders by much less than the full extent of the surcharges associated with PAYD and PATP.

B. THE APPLICATION OF ECONOMIC PRINCIPLES IN THE ANALYSIS OF BAH AND MHPI FOR THE MONTEREY BAY AREA

The application of economic principles in analysis of BAH and MHPI for the Monterey Bay area revealed the DoD and Congressional incentive to privatize military housing. The major incentive includes the economic advantages possessed by the private sector in the construction of housing and the projected 10 percent savings over the 50-year lease.

Clark Pinnacle, a limited liability corporation, provides protection for the founding companies against creditors in the event of Clark Pinnacle bankruptcy. Clark Pinnacle, like other private sector companies, is profit motivated. Currently, Clark Pinnacle is experiencing larger than anticipated losses due to a lower than expected occupancy rate and the continuing growth of purchasing power for senior military officers in the form of BAH increase since 2000. The increased purchasing power has provided the capability for senior officer to rent and purchase housing in the Monterey area, resulting in a lower occupancy rate for privatized housing. Clark Pinnacle will likely be financially successful once occupancy rates increase and once newer housing start coming on line thus attracting service members back into privatized housing.

The service members are the customers of BAH and privatized housing. Service members will make decisions whether to live in the community or privatized housing based on their perceived economic benefits.

C. CONCLUSION

This research was started with the intent to find a close logical analogy between the conversion of automobile insurance from a fixed to a variable cost and an analysis of BAH and MHPI in the Monterey Bay area. At the conclusion of my research, I am no longer certain that a relationship exists outside of using economic factors for analysis. During the process of research, two additional areas of continued research became

obvious and would be beneficial to both DoD and Clark Pinnacle concerning the privatization of military housing. The two areas of recommended continued research are described in the appendix.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX – RECOMMEND CONTINUED RESEARCH

A OVERCOMING THE TRAGEDY OF THE COMMONS IN PRIVATIZED HOUSING

Military housing can be viewed from the standpoint of the tragedy of the commons. Service members do not have the incentive to conserve utilities because they do not pay for them.¹⁰⁰ Some service members are less likely to care for military housing with the same level of care afforded to a house if they were the owner or a tenant in the civilian community.

An interesting challenge for future research is to study and recommend ideas to Clark Pinnacle to assist them in addressing the tragedy of the commons in order to maintain the quality of housing and still make a profit.

The research should include an analysis of maintenance and utility costs before and after the Clark Pinnacle's assuming ownership of privatized housing. Some of the information may be obtained from the Army's RCI office located at Fort Ord. In the analysis of maintenance and utility costs, reasonable assumptions would have to be made to distinguish between normal and excessive usages of utilities and repairs. The product should recommend a baseline for utility usage per privatized housing unit.

B. NEUTRALIZING THE SERVICE MEMBERS POWER BASE IN PRIVATIZED HOUSING IN THE MONTEREY BAY AREA

During the course of research, a new power base for service members was discovered that did not previously exist when housing was administered by the Navy in the Monterey Bay area. The new power possessed by service members is the power to recommend and influence inbound service members in regards to occupying privatized or commercial housing. Clark Pinnacle currently has an 85 percent occupancy rate and requires a 95 percent occupancy rate for financial success. An unintended consequence of the lower occupancy rate is that Clark Pinnacle is subject to the demands of service

¹⁰⁰ This statement does not accurately reflect the behavior of all service members.

members for fear of losing current and future tenants. For example, an officer and wife have entered the housing office and made specific demands of Clark Pinnacle. If the demands were not met, the officer and his wife indicated they would move out of privatized housing and would not recommend privatized housing to inbound students of which they are sponsoring. The management of Clark Pinnacle felt forced to meet the demands of the officer and his wife to avoid an even lower occupancy rate (less revenue) and a tarnished reputation in the eyes of the military.

The Privacy Act serves as a legal barrier between Clark Pinnacle and inbound students and staff to NPS and DLI. Some service members have recognized this new power and have taken advantage. By possessing the power to recommend or not to recommend inbound service members to privatized housing, service members have the potential to influence the short-term success of Clark Pinnacle. Since Clark Pinnacle's main source of revenue is monthly rental payments of BAH by service members, Clark Pinnacle now finds itself attempting to please every service member in anticipation of receiving a favorable endorsement from the tenants when sponsoring inbound service members. The capability of service members to influence the short term success of privatized housing is an unintended consequence. The department of the Army and Navy did not desire for service members to have the capability to influence the short-term success of privatized housing since both departments helped formed the limited liability corporation and hold seats on the board of directors.

A research project to neutralize the service members' power could be beneficial to both DoD and Clark Pinnacle. The research would include a closer look at the civilian-military relations, since Clark Pinnacle has no staff members with prior active duty experience managing the La Mesa office. A study of NPS and DLI staffs could reveal potential issues for improvement in the relationships between Clark Pinnacle and service members occupying privatized housing. The research should include recommendations for the neutralization of the service members' power base that did not previously exist when housing was administered by the government. The neutralization of the service members' power is required to promote the success of the Clark Pinnacle, Department of the Navy and Department of the Army in the privatization of military housing in the

Monterey Bay area. A possible recommendation could include the assignment of a military liaison as a collateral duty to assist Clark Pinnacle in contacting service members prior their arrival at Monterey or attaching Clark Pinnacle privatized housing contact information in welcome aboard packages to inbound service members.

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

- Alliance of American Insurers. (1990). Letter to Gary Klien, California Energy commission, San Francisco, CA Alliance of American Insurers, Pacific Region, June 15, James S. Stickles.
- Association of California Insurance Companies. (1990). Comments on Pay-As-You-Drive Proposal, letter to Barbara Crowley, Vice Chair, California Energy Commission, Sacramento, CA June 18, Thomas A Aceituno.
- Barrett, J. Community Director. Clark Pinnacle. Interview. (2004 April 16).
- Black, J. (1997). A Dictionary of Economics.
- Bowers. (1929). Compulsory Automobile Insurance, Vol. 2.
- Butler P. "Driver Record: A Political Red Herring That Reveals the Basic Flaw in Automobile Insurance Pricing." Journal of Insurance Regulation 8.
- Butler, P. National Organization for Women, Automobile Insurance Pricing: Operating Cost versus Ownership Cost; the implications for Women.
- Collier, B. Residential Communities Initiative Deputy Director. Interview. (2004 April 16).
- Congressional Budget Office. (1998). Housing Choices, and Military Allowances.
- DoD Housing and Competitive Sourcing MHPI. Retrieved April 12, 2003, from <http://www.acq.osd.mil/ie/index.htm>.
- DoD Per Diem, Travel and Transportation Allowance Committee. Retrieved April 12, 2003, from <http://www.dtic.mil/perdiem/bahfaq.html>.
- Elbert, Janet. (2003 September). Thesis NPS. Military Housing Privatization Initiative Lessons Learned Program: An Analysis.
- Else, D. H. (2001, July). CRS Report for Congress, Military Housing Privatization Initiative: Background and Issues.
- Friedman, D. (1983). The Fortune Encyclopedia of Economics, Law and Economics

GAO Report GAO-01-684, (2001). Military Personnel: Higher allowance Should Increase Use of Civilian Housing, but Not Retention.

Greenberg, A. Vehicle Use Pricing, FHWA Office of Transportation Policy Studies.

Guensler, R. (2003). Journal of Insurance Regulation, Vol. 2.

Guensler, Randall.(2003). Journal of Insurance Regulation, Vol. 23 Is 3. p. 32.

Gutierrez, R. (2001 July). Military Housing

Insurance Institute for Highway Safety. (1995). Pay-at-the-Pump: It Isn't Good Insurance; It Isn't Good Policy, Stephen L. Oesch Arlington VA: Insurance Institute for Highway Safety.

Ives, H. S. (1929). Compensation By a Tax on Gasoline. Compulsory Automobile Insurance, Vol. 2.

Khazzoom, D. J. (2000). Pay-at-the-Pump Auto Insurance: Review of criticisms and proposed modification. Journal of Insurance Regulation, Vol. 18, 4.

Khazzoom, D. J. Impact of Pay-at-the-Pump on Safety Through Enhanced Vehicle Fuel Efficiency. The Energy Journal, Vol. 18(3).

National Highway Traffic Safety Administration. (2002). The Economic Impact of Motor Vehicle Crashes. 2000.

Online TDM Encyclopedia. (2003 November). PAYD Vehicle Insurance; Converting Vehicle Insurance Premiums into Use-Based Charges.

Ulrich, L. (2004 March). Size Doesn't Always Equal Safety. Retrieved March 12, 2004, from http://money.cnn.com/2004/03/11/pf/autos/small_n_safe_0404/index.htm.

Vickery, W. (1969). Current Issues in Transportation. Contemporary Economic Issues.

Zeckhauser, R. (1983). Insurance, The Fortune Encyclopedia of Economics.

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
Ft. Belvoir, Virginia
2. Dudley Knox Library
Naval Postgraduate School
Monterey, California
3. Professor David R. Henderson
Naval Postgraduate School
Monterey, California
4. Dr. Raymond E. Franck, Jr.
Naval Postgraduate School
Monterey, California
5. LT Keith Adkins
Naval Postgraduate School
Monterey, California